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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,747	12/07/2005	Masashi Okubo	0038-0481PUS1	5934

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BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
HAMO, PATRICK	

ART UNIT	PAPER NUMBER
3746	

NOTIFICATION DATE	DELIVERY MODE
01/26/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/559,747	OKUBO, MASASHI	
	Examiner	Art Unit	
	PATRICK HAMO	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 December 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/7/05, 2/25/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the flange portions/short tubes or the cylinder and the intake channel connected to an outflow channel must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. The examiner is unable to distinguish the feature that the applicant refers to as the cylinder from that which is referred to as the flange portion/short tubes. One or the other must be more clearly pointed out or canceled from the claims.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5, 6 and 9-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant claims, in claims 5 and 6, "flange portions that are shaped as short tubes and are in sliding contact with an inner surface of the cylinder," but as far as examiner can tell, the cylinder is comprised of the tubes. Therefore, it is unclear how the tubes may be in contact with the cylinder.

Claims 12 and 13 are independently rejected under 35 U.S.C. 112 because they recite the limitation "respective flange portions of the inner yokes." There is insufficient antecedent basis for this limitation in the claims, as the flange portions were not positively recited as being part of the inner yokes, and there is no support for this limitation in the drawing or specification as understood, as the flange portions do not appear to be part of the inner yokes.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-10, 14, 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roth et al., US 4,965,864 in view of Ohki et al., US 5,302,872.

In regard to claim 1:

Roth discloses an electromagnetic pump where a plunger 4 including a magnetic body 5 is provided so as to be capable of sliding inside a cylinder 3 that is sealed at both ends by a pair of frames 8 with spaces (generally designated at 71) forming pumping chambers, electromagnetic coils 1 disposed around the cylinder, a fluid conveyed by passing a current through the coils to drive the plunger (Abstract), wherein intake valves 6 and outflow valves 7 are provided inside the frames. Roth fails to disclose that the coils are air-core electromagnetic coils.

However, Ohki teaches that air-core coils may be used to linearly reciprocate an element in a linear motor (Abstract). Ohki teaches that air-core coils and ferromagnetic coils are functionally equivalent and interchangeable (column 3, lines 14-17). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use air-core coils as taught by Ohki et al. as the electromagnetic drive coils of Roth in order to produce linear motion of the piston of Roth.

In regard to claim 2:

Roth is silent as to the material of the frames 8, but it would have been obvious to one of ordinary skill in the art that to construct it of a magnetic material would disrupt the flux in the motor that operates the plunger. Therefore, it would have been obvious to have constructed the frames of a non-magnetic material.

In regard to claims 3 and 4:

Roth discloses layers of magnets alternating with a non-magnetic matrix (se fig. 2) such that the non-magnetic matrix may be interpreted as inner yokes that sandwich the magnets in the axial direction and connect a series of unitary plungers 5.

In regard to claims 5 and 6:

As the examiner understands, the cylinder and tubes are one and the same. The tube-shaped cylinder 3 therefore substantially reads on this claim as understood.

In regard to claims 7-10:

The plungers are sealed by piston rings 19 that are positioned at an outer circumferential surface of the magnetic plunger.

In regard to claim 14:

Soft iron filings 15 surround the outer yoke coils.

In regard to claim 15:

While the coils go the length of the pump in fig. 1, the plunger takes up at least half of the length of the pump, such that any given inner yoke is restricted by the plunger to moving only about half the length of the coils, such that the length of the coils is longer than the movable range of any given inner yoke.

In regard to claim 20:

A piston position sensor outputs data to a controller that drives the piston (column 3, lines 48-59).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Chang, US 6,783,335.

The references as applied to claim 1 above teach all of the limitations substantially as claimed except for a damper that eases shocks provided in the frame. However, Chang teaches what is well known in the art, that teaches what is well known in the art, that pistons produce a lot of noise and unwanted vibration when they reciprocate and that providing a damper in a frame attached to the piston cylinder would ease this (column 7, lines 20-27).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 in view of Black et al., US 6,971,861.

The references as applied to claim 1 above teach all of the limitations substantially as claimed except for a damper that eases shocks provided in the piston. However, Black, similarly to Chang, teaches what is well known in the art, that pistons produce a lot of noise and unwanted vibration when they reciprocate and that providing a damper in the piston would also ease this (col. 2, lines 6-15).

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 in view of Dittrich, US 6,568,921.

In regard to claim 18:

The references as applied to claim 1, particularly Roth, teach a linear motor pump with two sets of inlets 6 and two sets of outlets 7. Roth is silent as to where the fluid comes from to get to the inlets, and where it goes once it leaves outlets 7. However, it is common in the art to have a dual stage pump where the two stages are perfectly out of phase with each other, as is the case in a two-sided reciprocating pump such as the one taught by Roth, to join together the intake from a single reservoir and to reunite the outflow in a single discharge for steady flow that could not be accomplished with a single stage pump. Dittrich teaches just that, with common intake 60 for two cylinders 12a and 12b and common discharge for the two at 80. It would have been obvious to one of ordinary skill in the art to modify the nominal intake and discharge of Roth (combined with the air core teaching of Ohki) with the combined intake and discharge of Dittrich to achieve steady discharge.

In regard to claim 19:

Insofar as the claim is understood, without drawings that adequately show the features in their most intuitive understanding, the intake and outflow channels are fluidly connected by way of one or the other of the two pumping chambers (see fig. 1).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/Patrick Hamo/
Patent Examiner, AU 3746